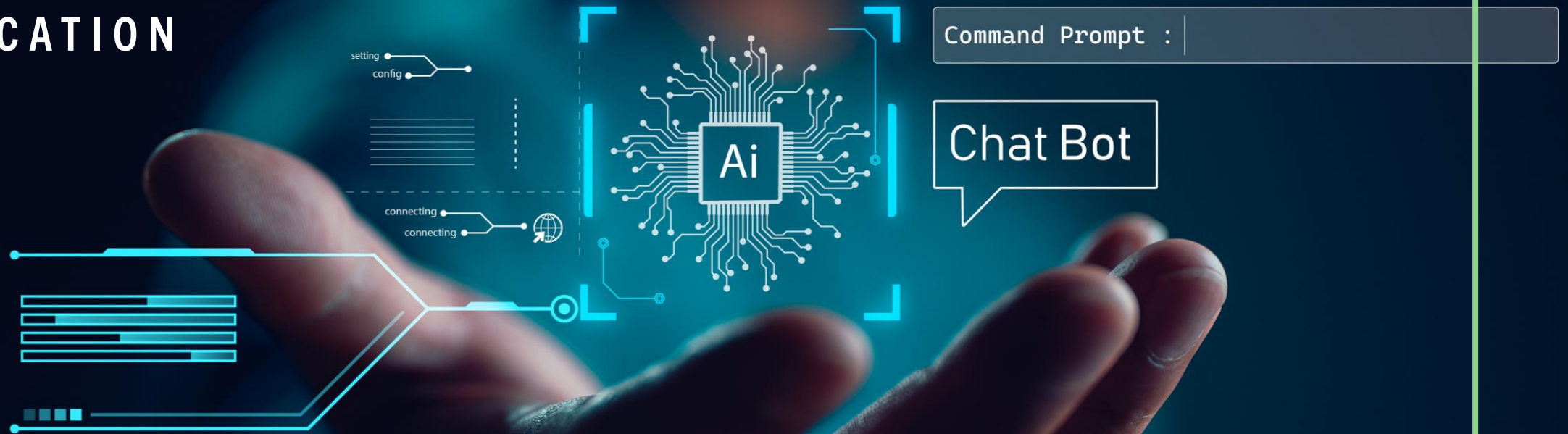


# EMBRACING ARTIFICIAL INTELLIGENCE IN EDUCATION



Falmouth University's Innovative Approach

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## AI-ASSISTANCE

Many artificially intelligent tools already exist to assist authors of creative works. Take, for instance, Grammarly, which has been helping authors since 2009.







# Copilot

A whole new way to work

## SCIgen - An Automatic CS Paper Generator

[About](#) [Generate](#) [Examples](#) [Talks](#) [Code](#) [Donations](#) [Related](#) [People](#) [Blog](#)

### About

SCIgen is a program that generates random Computer Science research papers, including graphs, figures, and citations. It uses a hand-written **context-free grammar** to form all elements of the papers. Our aim here is to maximize amusement, rather than coherence.

One useful purpose for such a program is to auto-generate submissions to conferences that you suspect might have very low submission standards. A prime example, which you may recognize from spam in your inbox, is SCI/IIIS and its dozens of co-located conferences (check out the very broad conference description on the [WMSCI 2005](#) website). There's also a list of [known bogus conferences](#). Using SCIgen to generate submissions for conferences like this gives us pleasure to no end. In fact, one of our papers was accepted to SCI 2005! See [Examples](#) for more details.

We went to WMSCI 2005. Check out the [talks and video](#). You can find more details in our [blog](#).

### Generate a Random Paper

Want to generate a random CS paper of your own? Type in some optional author names below, and click "Generate".

Author 1:   
Author 2:   
Author 3:   
Author 4:   
Author 5:

SCIgen currently supports Latin-1 characters, but not the full Unicode character set.

# SCIgen, AGAIN?

In 2005, Stribling, Krohn, and Aguayo created a system capable of generating computer science papers --- some of these were published following peer-review



## CREATIVE USE OF AI

- ▼▼ *Procedural content generation is already commonplace; though, generative artificial intelligence, which leverages machine learning, has grown considerably in sophistication and accessibility in recent years.*













yeah it looks great

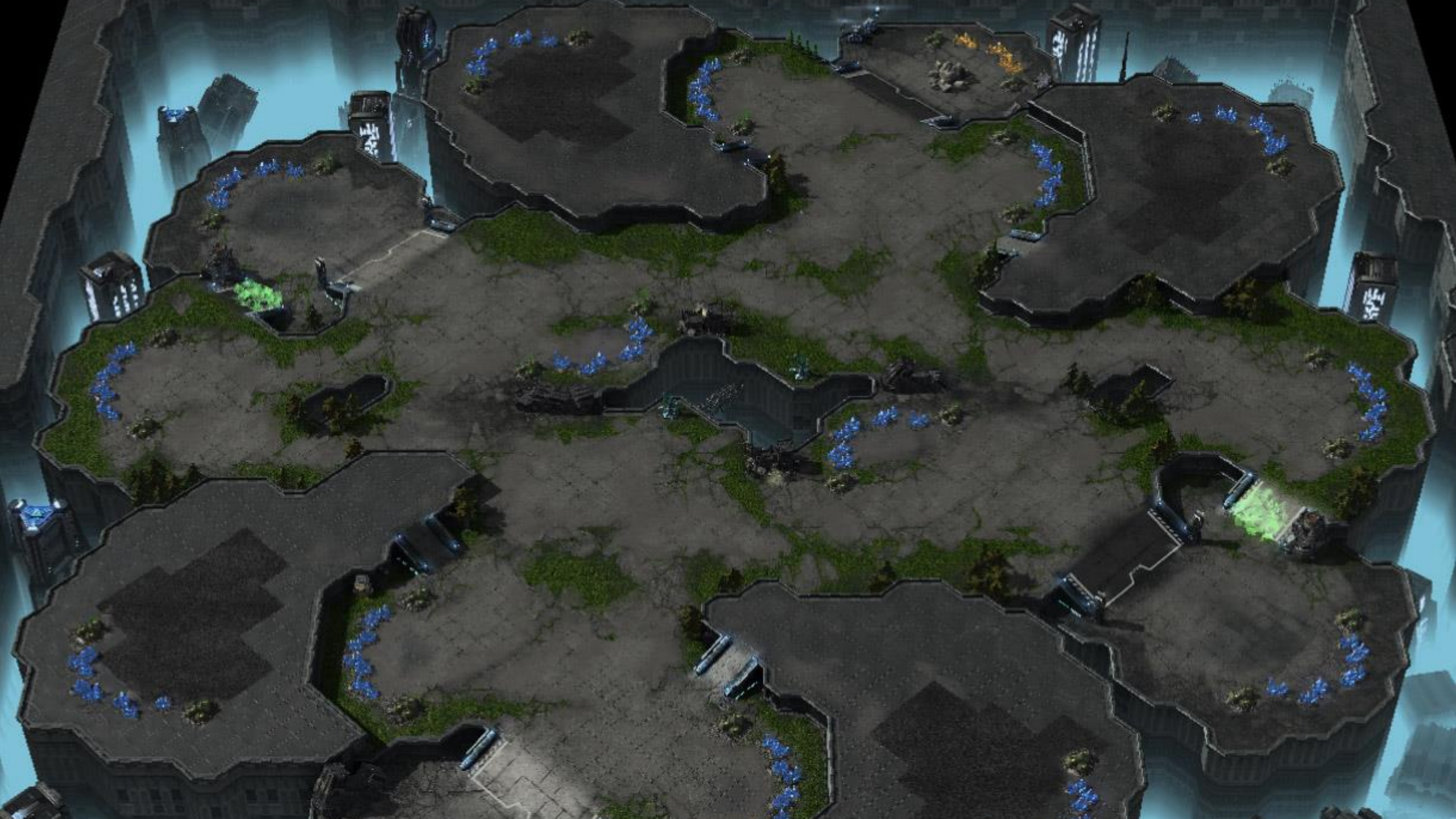


















# To That Sect

Press Spacebar To Start

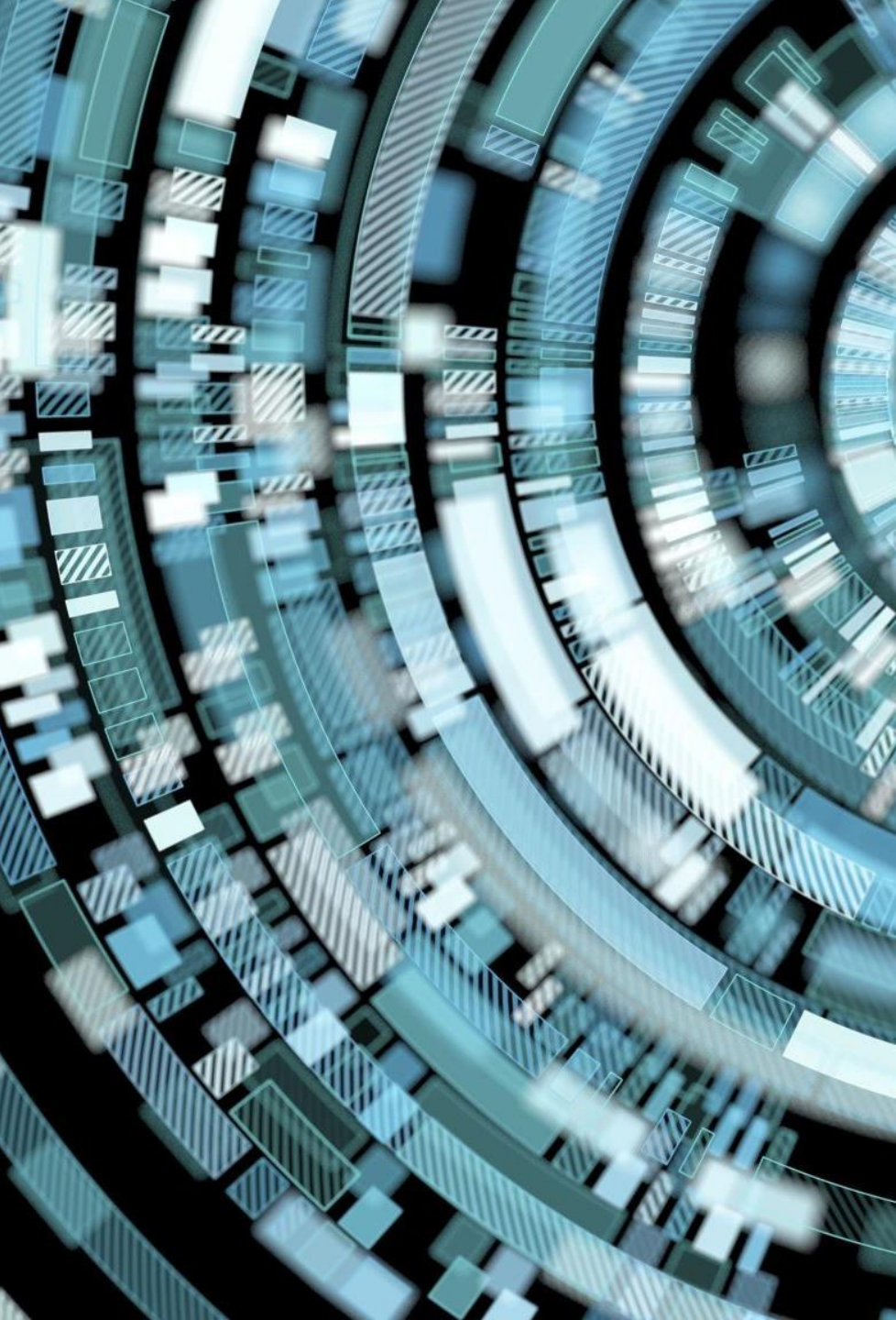
Collect



Avoid







# PROCEDURAL GENERATION

Procedural content generation (sometimes "good old-fashioned artificial intelligence") uses symbolic representations and rules to author content:

- **Pseudo-random number generators**  
Mersenne twister, perlin noise
- **Generative Grammars**  
Lindenmayer systems, split grammar, shape grammar
- **Image Filtering**  
Binary morphology, convolution filters
- **Spatial Algorithms**  
Tiling and layering, grid subdivision, fractals, voronoi
- **Complex Simulation**  
Cellular automata, tensor fields, agent simulation,
- **Evolutionary Computation**  
Genetic algorithms
- **Planning and Constraint Satisfaction**  
Pathfinding, goal-orientated action planning, monte-carlo tree search





# GENERATIVE AI

Generative artificial intelligence can be distinguished as its non-symbolic techniques based on machine learning:

- **Generative Adversarial Networks**

*Goodfellow et al (2014)*

Generator Model and Discriminator Model, usually based on convolutional neural networks.

Examples: Midjourney, StableDiffusion, Dall-e

- **Generative Pre-Trained Transformer Models**

*Vaswani et al (2017)*

Deep neural networks that use an encoder-decoder model to transform one sequence into another.

Examples: GPT-n, PaLM-n, CoPilot









Can you roleplay a version which involves the use of Liberator's Neutron blasters to destroy the pursuit ship? Please ensure Zen prompts the crew to prime the blasters and to activate safety measures such as the radiation flare shield prior to firing - reference the sequence from the script of Blakes 7



Sure, I'll give it a try. Here's a roleplay scenario where The Liberator uses its neutron blasters to destroy a Federation Pursuit Ship:



Crew: Zen, we have detected a Federation Pursuit Ship approaching. Can we take it out with our neutron blasters?

Zen: The Pursuit Ship's armor plating is highly resistant to conventional weapons, but a sustained barrage of neutron blasters may be able to penetrate its defenses. However, we must ensure that all safety measures are activated before firing, including the radiation flare shield.

Crew: Understood. Priming the neutron blasters and activating the radiation flare shield now.

Zen: Radiation flare shield activated. Neutron blasters primed and ready for firing.

Crew: Firing the neutron blasters!







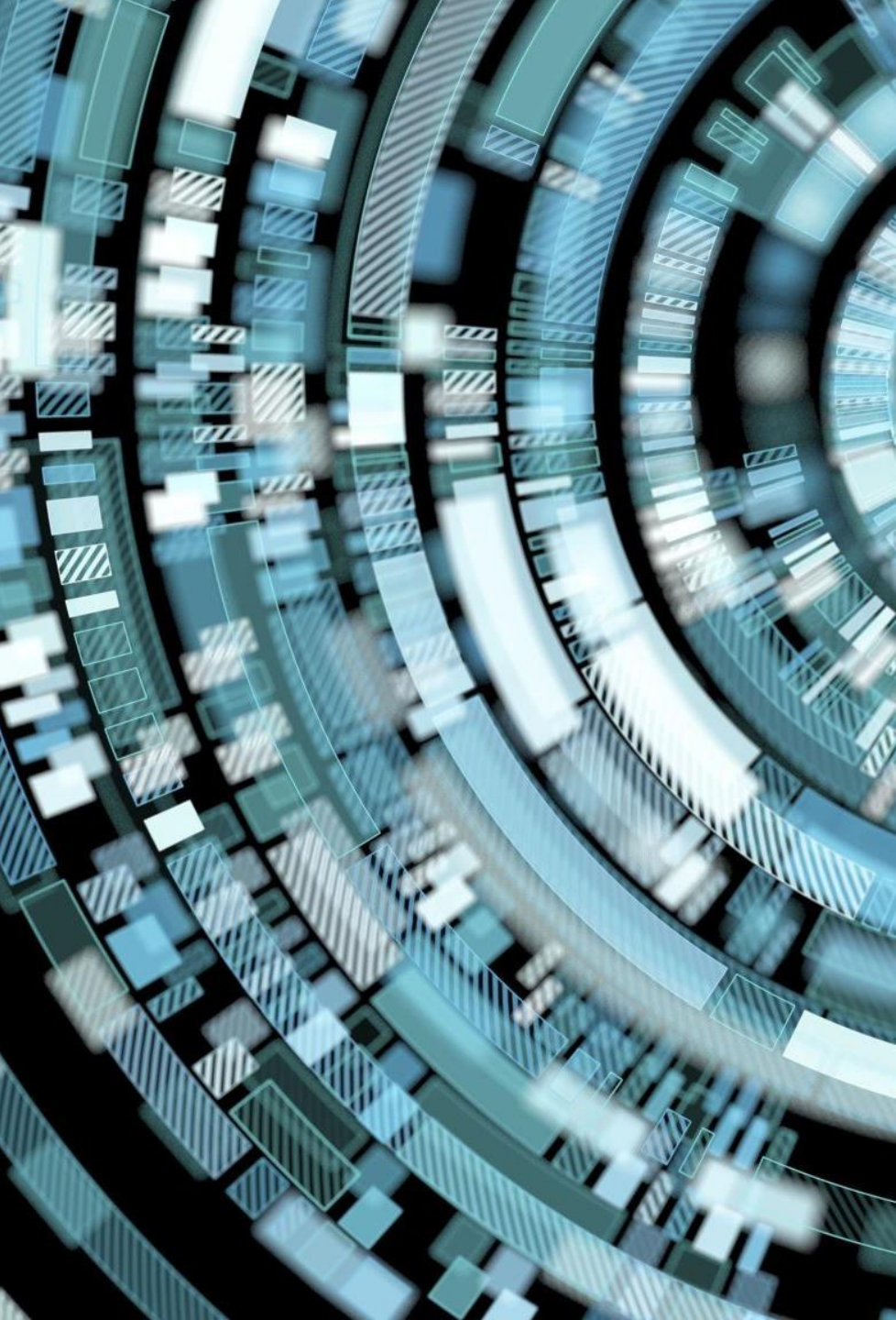




## POLICY CONCERNS

- Students face significant psychosocial challenges and can be particularly susceptible to plagiarism, commissioning, or more recently, misuse of generative artificial intelligence (Deng et al., 2022).
- Many colleagues admit to worrying about the misuse of artificially intelligent tools to undermine assessment or, in some contexts, misuse research data (Van Dis et al., 2023).



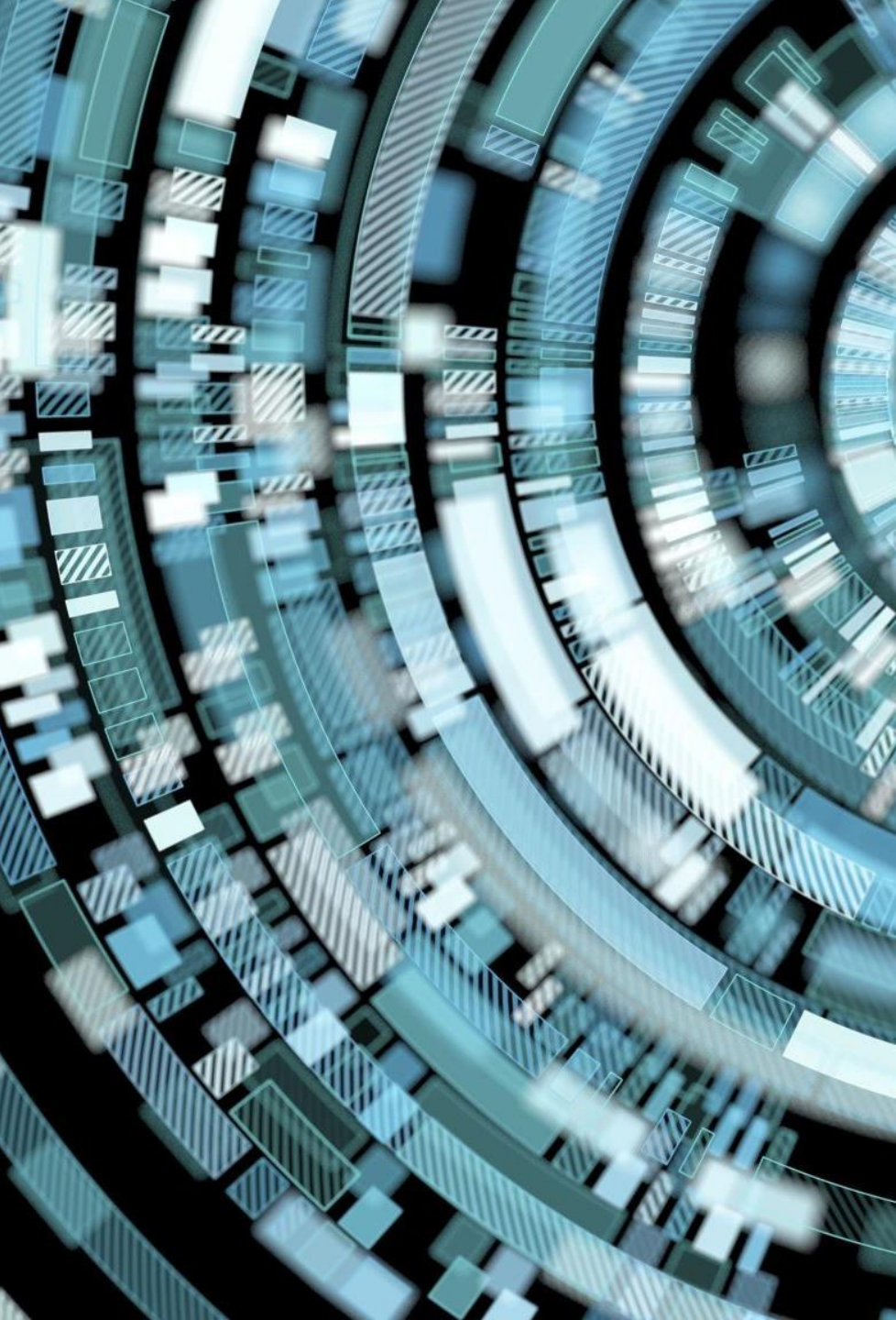


## ALIGN WITH PRACTICE

- ▼▼ *The tutor was quick to stress that use of cutting edge digital graphic tools is common, and the issue is not with the new tools, but how we ensure students have a framework for using them.*







## ALIGN WITH PRACTICE

“ Equip students with artificial intelligence skills they can take into the world of work. ”

## **OBJECTIVE**

To consider an appropriate direction to move in line with the rise of easily accessible artificial intelligence, a technology which continues to disrupt the concept of plagiarism, collaboration, and intellectual property.





## CONSIDERATIONS

- Ban the use of technology, reverting to previous models of assessment that removes AI from the equation
- Outpace the growth of AI by adapting modes of assessment that are robust to misconduct
- Permit the use of artificial intelligence with clear parameters about its use







## EMBRACE AND UNDERSTAND

- Recognise the existence of artificial intelligence as a high-tech tool – i.e., the “embrace and understand” option.
- Develop clear parameters about the use of artificial intelligence, providing appropriate guidance and orientation





## EMBRACE AND UNDERSTAND

- The awareness avalanche is prompting a re-evaluation of “authentic assessment” modes and what that means in context of AI “interference” in assessment practices.
- There are some incredibly valuable equality and accessibility opportunities this also represents.



## OBJECTIVE



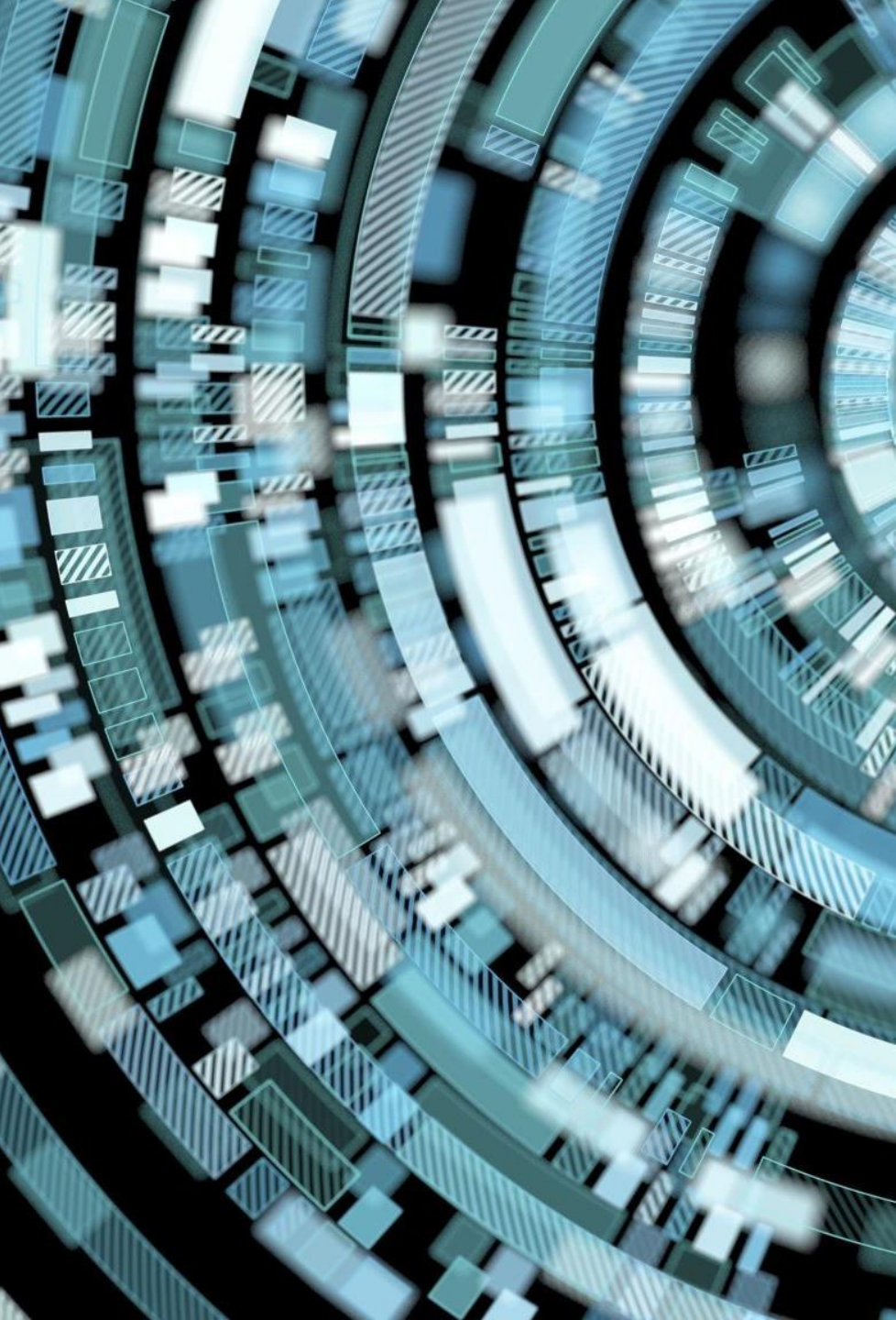
*Machines play an important role, but as tools for the people posing the hypotheses . . . and making sense of the results.*











## ACADEMIC CULTIVATION

- ▼ Educators can leverage artificial intelligence to build supportive learning environments for students who have cultivated good character. ▼





## KEY PRINCIPLES

We are structuring our guidelines around three key principles:

- Authenticity
- Responsibility
- Accountability



## AUTHENTICITY

Move forward towards an authentic assessment ethos for all academic assessments.





## AUTHENTICITY

In service of authenticity, course teams will align the evolution of assessment practices with the novel technologies students will encounter in the future.



## RESPONSIBILITY

Integrate artificial intelligence as part of the educational experience without compromising the development of key skills.





## RESPONSIBILITY

In service of responsibility, academics will need to consider how to integrate artificial intelligence into learning experiences to avoid undermining the learning outcomes they seek to assess.



## RESPONSIBILITY

In service of responsibility, students will need to avoid undermining the development of their own competencies.





## ACCOUNTABILITY

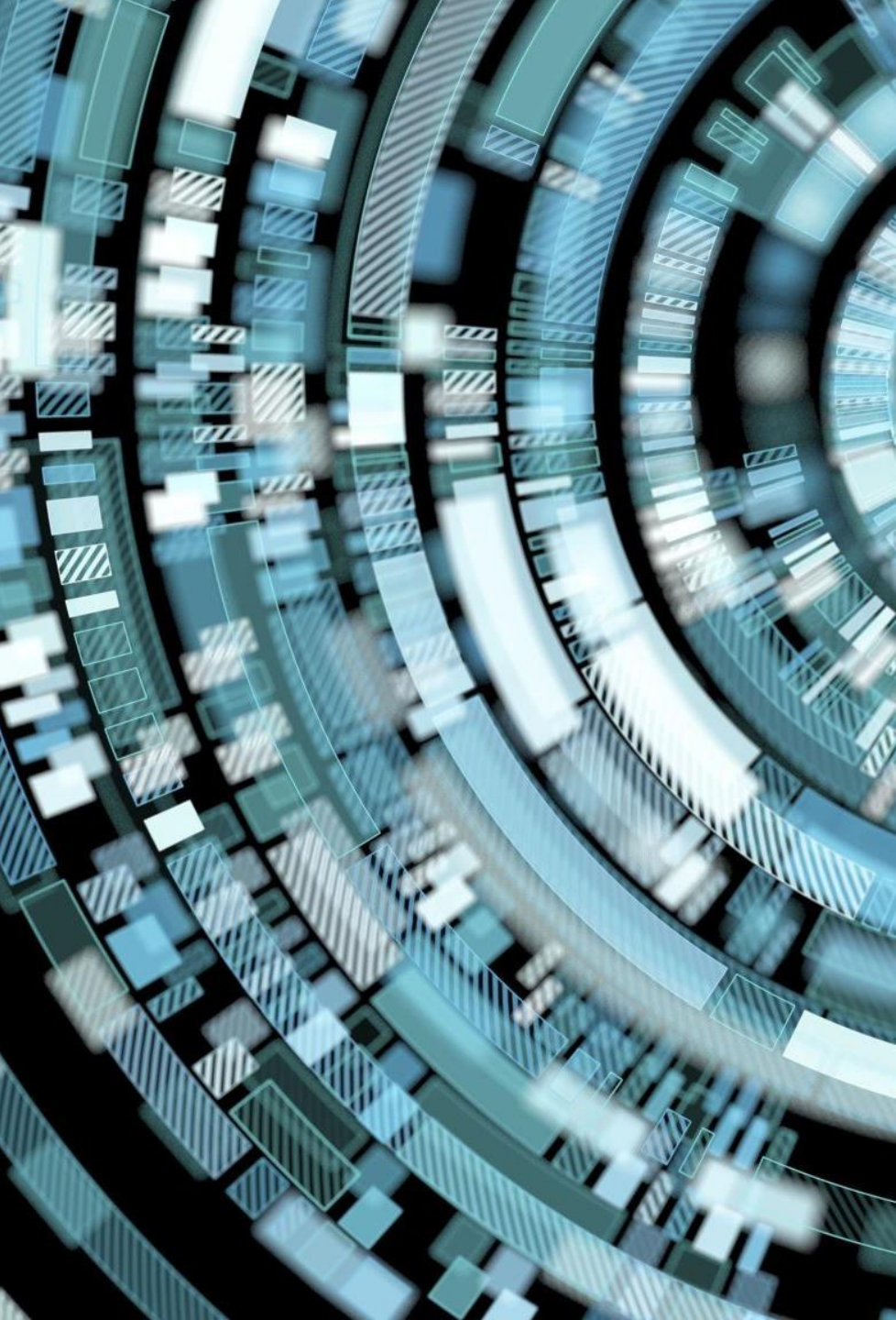
Strengthen the need to evidence and account for the process of creating work for assessment.



## ACCOUNTABILITY

In service to accountability, the institution will convey strong messaging to students regarding the professionalism of their creative practice and how to evidence their craft.





## ACADEMIC CULTIVATION

▼▼ *It's about academic standards,  
not catching “cheating”  
because... it is not clear yet  
what is considered cheating with  
AI!* ▼▼



## ADVICE FOR 23/24

- Exercise caution around use and interpretation of detection tools. Many are unreliable and unverified.
- Generative AI is a useful study aid and this should not be discouraged; they are tools like many other tools and their use to enhance learning is beneficial.
- The first step is to communicate with all students (including returning students) and to engage in conversation about potential use.
- Clearly articulate that students are not permitted to present the outputs of artificial intelligence as their own work; not to preclude its use in assessment but rather to ensure that use is appropriate from an academic integrity perspective.





## ADVICE FOR 23/24

- If staff decide to allow use of AI in disciplinary contexts for assessment, they should clearly set out their expectations on its acceptable AND unacceptable use in an auditable format to students (i.e., documented, preferably in several places), updating existing declarations, acknowledgements, student handbooks/guides and module webpages to reflect this in a consistent manner



## ADVICE FOR 23/24

- Students must be facilitated by staff (i.e., through documentation, declaration, acknowledgement etc) to be able to make it completely clear how far they have developed their work from any Generative AI input (this could include opportunity for a list of the prompts used to be provided or correct citation of all resources accessed etc).
- Where there is a requirement to redesign an assessment or element of assessment, then that should be part of the normal course modification cycle only and not approached in a rushed or ad hoc way and only with the knowledge of colleagues in SPA and QAE





## ADVICE FOR 23/24

- Brief students that it is also their responsibility to take steps to ensure the accuracy and relevance of any submitted assessment artefact, in any format (text, visual, auditory etc) and in line with the existing academic integrity policy.
- Use of AI in the immediate term should be limited to formative assessment work and/or feedback and used as part of the learning longitudinally to mitigate significant academic integrity risks



## FUTURE WORK

In the longer term, we seek to explore strategies for robust assessment, harnessing artificial intelligence to enhance the student experience and respond to the change in the labor market.



# REFERENCES

- Crawford, J., Cowling, M., & Allen, K. (2023). Leadership is needed for ethical ChatGPT: Character, assessment, and learning using artificial intelligence (AI). *Journal of University Teaching & Learning Practice*, 20(3).  
<https://doi.org/10.53761/1.20.3.02>
- Deng, X. and Yu, Z., 2022. A systematic review of machine-translation-assisted language learning for sustainable education. *Sustainability*, 14(13), p.7598.
- Pascoe et al., 2020 Van Dis, E.A., Bollen, J., Zuidema, W., van Rooij, R. and Bockting, C.L., 2023. ChatGPT: five priorities for research. *Nature*, 614(7947), pp.224-226.
- Lea, M.R. and Street, B.V., 1998. Student writing in higher education: An academic literacies approach. *Studies in higher education*, 23(2), pp.157-172.
- Archer-Kuhn, B., Lee, Y., Finnessey, S. and Liu, J., 2020. Inquiry-based learning as a facilitator to student engagement in undergraduate and graduate social work programs. *Teaching & Learning Inquiry*, 8(1), pp.187-207.

# REFERENCES

- Thi, N.K., Nikolov, M. and Simon, K., 2022. Higher-proficiency students' engagement with and uptake of teacher and Grammarly feedback in an EFL writing course. *Innovation in Language Learning and Teaching*, pp.1-16.
- Shaker, N., Togelius, J. and Nelson, M.J., 2016. *Procedural content generation in games*. Springer.
- Hendrikx, M., Meijer, S., Van Der Velden, J. and Iosup, A., 2013. Procedural content generation for games: A survey. *ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)*, 9(1), pp.1-22.
- Smith, G., 2017. Procedural content generation: An overview. In: *Level Design: Processes and Experiences*, Totten, C.W. (ed), CRC Press. pp.159-183.
- Goodfellow, I., Pouget-Abadie, J., Mirza, M., Xu, B., Warde-Farley, D., Ozair, S., Courville, A. and Bengio, Y., 2014. Generative adversarial nets. *Advances in neural information processing systems*, 27.
- Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A.N., Kaiser, L. and Polosukhin, I., 2017. Attention is all you need. *Advances in neural information processing systems*, 30.